

ABSTRACT

A timing and frequency offset estimation method for OFDM use an analytic tone in calculating timing offset estimation and a frequency offset estimation. An analytic tone includes a signal that contains only one subcarrier and has characteristics of a uniform magnitude and a uniform phase rotation. The estimation algorithm with an analytic tone is based correlation function. By changing the interval between two samples in correlation, the maximum estimation range for the frequency offset can be extended to $\pm N/2$ subcarrier spacing, where N is the number of total subcarriers. Thus, the frequency synchronization scheme for OFDM systems has a wider range and a more simple complexity than traditional ones requiring separate fine and coarse synchronization.